

The role of design thinking in education management as a design science

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Abstract

Organization and general management theory is not sufficient to solve the contemporary education problems. This complex, ill-formulated, misleading social problems need an interdisciplinary synthesis of the various sciences and the experience of education practice. Thus, the purpose of the paper is to discuss on the epistemological and methodological status of the education management field seen from the perspective of design sciences and design thinking approach. Design thinking comes from designers' practice and at present it is an approach to creative and innovative ways of solving open, complex and unambiguous management problems. As a part of scientific knowledge in the design sciences dealing with human projects and aimed at changing existing situations into preferred ones may provide a new perspective of the description and explanation of education management problems. The discussion is theoretical and primarily based on the method of the analysis and criticism of literature on management, education management, design thinking and the sciences of the artificial. The research method used to solve the scientific problem is deduction referred to the critical literature study.

Keywords: design thinking, design sciences, education management, innovation, creativity.

Introduction

The contemporary problems that education needs to deal with require some interdisciplinary synthesis of the various sciences combined with the experience of practice. Organization and general management theory is not sufficient to solve these wicked problems. According to Richard Buchanan wicked problems are a „class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing” (Buchanan, *Wicked Problems in Design Thinking, Design Issues*, 1992, Vol. 8/2 p. 15). Faced with such problems, attempting to put education management in the positivist framework of management sciences can lead to a distortion of education.

Thus, the purpose of the paper is discussion on the epistemological and methodological status of the education management field seen from the perspective of design thinking approach. Although design thinking comes from designers' practice, at present it is an approach to creative and innovative ways of solving open, complex and unambiguous management problems in numerous organizations, also educational issues. Design thinking gradually becomes a part of the body of scientific knowledge in the sciences of the artificial or design sciences as Herbert Simon called all practical sciences dealing with human products. According to Simon, there are fundamental differences between artificial/design sciences and normal/explanatory sciences. Although design may be associated mainly with industrial art or creating new products, according to Simon everyone designs who devises courses of action aimed at changing existing situations into preferred ones (Simon, 1992).

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Changing existing situations into preferred ones is also an important purpose of education management. There are at least two arguments for adopting the design paradigm in education management. First, the nature of the subject of research is the area of human activity, even if the learning processes themselves are naturally conditioned and require explanatory research. In the area the question "what is" is not enough to change existing situations for the better. The more desirable question is "what can be", which leads to prescriptive knowledge. Secondly, the design science framework may contribute to solving the critical weakness of organization and management theory also in the field of education. The weakness is the relevance gap between theory and practice - management theory is not obvious or relevant to education practitioners.

The discussion undertaken in the paper is theoretical and primarily based on the method of the analysis and criticism of literature on management, education management, design thinking and the sciences of the artificial. The research method used to solve the scientific problem is deduction, which referred to the critical literature study has allowed to achieve the research goal.

Education management

According to R. Dorczak until recently it has been extremely difficult to find any reference to management in the field of educational research and practice. Teachers, school heads, school administrators, politicians and even school researchers did not seem to see a connection between the two areas (Dorczak, 2009, p. 11). Such an attitude, according to M. Bottery, resulted from the typical conviction in the education field that the only real and valuable issue in education is the teaching itself (Bottery, 1992, quoted in Dorczak 2009, p. 11-12). Literature review allows to conclude that there is still very few scientists who conduct research and write about education management in Poland.

The situation is very different in the USA, where according to R. Heck i P. Hallinger, „interest in what managers do (e.g. work activities, decision-making, problem solving, resource allocation) and what they do that makes a difference (e.g. leading change, promoting organizational learning, influencing organizational processes and outcomes) have long captured the attention of scholars” (Heck, Ballinger, 2005, p. 230). However, researchers in educational management and leadership have not built their own field specificity. As R. Heck i P. Hallinger write, they „have borrowed liberally from scholars who became identified with theories of scientific management, human relations, transformational leadership, and organizational learning during the 20th century” (Heck, Ballinger, 2005, p. 230).

The review of research on management in education field indicates that when examining education management, it should also be considered education leadership as a field closely related. As T. Bush writes, „there is great interest in educational leadership in the early part of the 21st century because of the widespread belief that the quality of leadership makes a significant difference to school and student outcomes” (Bush, 2007, p. 391). He claims that if schools are to provide the best possible education for their learners, they require skilled and effective leaders and managers (Bush, 2007).

However, it is not easy to draw a clear line between leadership and management in education. Most often, both fields referred to in literature coexist in one word group - as education(al) leadership and management or in other very similar ones (e.g. Briggs and Morrison, 2012; Bush, 2007; Heck and Ballinger, 2005; Johnson, 2004). According to T. Bush, „the concept of management overlaps with that of leadership” (Bush, 2007, p. 392). Some researchers, however, distinguish management and leadership in education. L. Cuban links management with maintenance activity - realizing efficiently and effectively current organizational arrangements, and leadership with change - influencing others' actions in achieving desirable results, shaping the goals and actions of others (Cuban, 1998, quoted in Bush, 2007, p. 392). In practice actually, management and leadership interpenetrate and bond in the pursuit of shared results. Thus, it is so difficult to draw the line between them.

According to R. Heck i P. Hallinger, who conducted systematic research on the state of research in educational leadership and management as a field of study, another significant problem is the lack of empirical rigor in conducted research in the field (Heck, Ballinger, 2005). As they claim, „although the topics of educational management and leadership have generated a great deal of scholarly interest internationally over the years, reviewers have generally suggested it has not been an area given to rigorous empirical investigation and knowledge accumulation” (Heck, Ballinger, 2005, p. 230).

In the face of the diversity (not to say a mess) of paradigms, methods and research tools used by educational management and leadership researchers P. Heck i P. Hallinger note that:

„We must be able to separate what moves the field intellectually from what continues to spin it in ideological or methodological circles. Otherwise, the field will revert back to the times of folklore and alchemy. It is one thing to celebrate the diversity of approaches and legitimacy of all ideas. It is another, however, to judge the worth of those ideas in providing solutions to persistent problems and enhancing understandings of our disciplinary practices. Refusal to define the significant problems that should be studied and to demand rigorous investigation before granting legitimacy makes it difficult to determine if the field is moving intellectually on the wheels of increased conceptual and methodological diversity. New intellectual approaches should also demonstrate their worth through viable means of argument and inquiry. If science has no more privilege than ideological belief, intuition, myth, or alchemy in commenting on human endeavors, then it calls into question the whole meaning of scholarship. If this is the case, then there will be few lasting disciplinary outcomes from the ‘study’ of educational leadership and management” (Heck, Ballinger, 2005, p. 238).

Closed attention should be paid to the challenges outlined above, especially considering how relatively young discipline education management is. As R. Dorczak claims, education management is relatively new discipline growing from general management, especially public management. The latter may be treated as a discipline of management related to the public sphere (Dorczak, 2012, p. 39-47). T. Bush makes a similar conviction: „one key debate has been whether educational leadership is a distinct field or simply a branch of the wider study of management” (Bush, 2007, p. 391).

Dorczak tries to indicate the specificity of education management as a separate domain (Dorczak, 2012, p. 39-47). According to him, education management is still looking for its own identity and specificity (Dorczak, 2012, p. 40). He notices that increasing importance of educational organizations in the contemporary world requires building the foundations of knowledge enabling better management in these organizations. For this purpose, however, it is not enough to simply adapt the theory, principles, methods and tools of general management to education (Dorczak, 2012, p. 39-47).

As A. Koźmiński rightly observes, methods and solutions simply borrowed from other cultural contexts or working well in other kinds of institution may not work elsewhere (Koźmiński, 1996 quoted in Dorczak, 2009, p. 13). M. Bottery suggests the need for a more culturally and politically contextualised approach to models of leadership (Bottery, 2001, p. 199-218). The process of education management development must take into account an in-depth understanding of individual development processes on the one hand and the more extensive educational context of these processes (as the specific organizational culture or the deeper sense of educational processes) on the other hand (Dorczak, 2012, p.42-46). Thus, as R. Heck and P. Hallinger rightly notes, the field needs the systematic development of epistemology, conceptual frameworks, methodology, and all that is at the core of how the knowledge is constructed (Heck, Ballinger, 2005, p. 238).

Taking the all above into consideration, it essential, as T. Bush claims, „to provide a set of tools from which discerning leaders can choose when facing problems and dealing with day-to-day issues” (Bush, 2007, p. 393). Naturally, some of the tools would have more managerial and some leadership capacity. The managerial side of education management is strongly connected with the processes of planing, designing, organizing and realizing any school activity in which resources are transformed

into expected results. Leadership, according to Bush, „can be understood as a process of influence based on clear values and beliefs and leading to a ‘vision’ for the school. The vision is articulated by leaders who seek to gain the commitment of staff and stakeholders to the ideal of a better future for the school, its learners and stakeholders” (Bush, 2007, p. 403). As stated above, management and leadership in school practice are parties of the same coin. They are melted in one whole process that can deliver valuable results.

The mentioned above broad diversity of paradigms methods, conceptual frameworks and research tools used in education management can be both an opportunity and a threat. T. Bush remarks that the existence of multiple perspectives and approaches to education management creates conceptual pluralism. It may be treated as an asset. Each theory offers something in explaining the operation mechanisms of educational institutions and somehow influence decision-making in the institutions (Bush, 2007, p. 393). However, the pluralism can also lead, according to T. Bush, to many competing perspectives and an inevitable lack of agreement on the exact nature of the discipline (Bush, 2007, p. 391). It can be used as an epistemological and methodological mess to provide any explanation, any theory to justify someone’s point of view or solutions that support one’s interests. If strict rules of how the valid knowledge is constructed are not determined, anything actually goes. The recognized knowledge in the field is rather the result of an agreement between scientists than the proven outcome of rational research and inference processes.

Design science and the problem of relevance

According to J. van Aken, „there are serious doubts about the actual relevance of present-day management theory as developed by the academic community (Aken, 2004, p. 219). He recalls D. Hambrick’s conclusions on the role and meaning of management addressed to the American Academy of Management and claims that „Hambrick (1994) sketched a dismal picture of the Academy’s impact and concluded that it might have mattered to the world of organizations and business, but that it did not” (Aken, 2004, p. 220). Such arguments may be addressed also to education management field. Taking them into consideration, the proposition of management education as a design science definitely require a deeper analysis and a broader description. Thus, specific research tasks of the following part of the paper are: (1) to indicate a possibility of a different approach to education management field - design science approach (different from the commonly accepted one), (2) to indicate reasons why it should be realized and (3) to determine and describe the essence of the proposed approach.

The fundamental reason, why a different theoretical approach for education management field is needed, is the problem of relevance to practice. A number of authors draw attention to the problem of relevance of the organization and management research for practice (Aken, 2004; Denyer, Tranfield, Aken, 2008; Hambrick, 1994; Huff, Tranfield, Aken, 2006; Romme, 2003).

D. Hambrick claims that we need „bridge theory and practice” (Hambrick, 1994, p. 13). He develops this statement among others with the words:

„It’s been said that there are three kinds of people: those who make things happen, those who watch things happen, and those who wonder what happened. To a great extent, the role of a scholar is in the middle category: to **observe, analyze, critique, and disseminate**. This is important work, and we should never take our eyes off it. However, when an academic field has as its charge the thoughtful preparation and guidance of practitioner professionals, and when an academic field deals in a domain that vitally affects societal well-being, then that academic field must enter the world of practical affairs. Without being co-opted, it must strive for influence and impact. That is our challenge. We should matter. We must matter.” (Hambrick, 1994, p. p. 16).

Management in general and education management in particular are the academic fields responsible for the *thoughtful preparation and guidance of practitioner professionals*. Thus, the above statement accurately describes the responsibility of education management scientists and researchers who *deal in a domain that vitally affects societal well-being* and have to *enter the world of practice affairs* to carry out valuable and useful scientific research. As J.van Aken claims, Hambrick suggests opening up the closed loop of management academic community to the outside world, the world of practice (Aken, 2004, p. 220). However, it is not so easy because, as Aken remarks: „Management theory is either scientifically proven, but then too reductionistic and hence too broad or too trivial to be of much practical relevance, or relevant to practice, but then lacking sufficient rigorous justification” (Aken, 2004, p. 221).

Similar conclusions come from the conversation between Anne Huff, David Tranfield and Joan Ernst van Aken entitled „*Management as a design science mindful of art and surprise*” (2006). D. Tranfield claims that the main reason to accept the design perspective for management field is that it might increase the relevance of research results to practice (Huff, Tranfield, van Aken, 2006, p. 415). He thinks it might also help establish strong management identity within the social sciences. He draw attention to an important issue by writing that „it is important for emergent fields to establish identity within the sciences. Not only does this create a shared sense of nationhood and purpose for established members and aspirants, but specifying limits to ragged boundaries, establishing shared ideologies and values, as well as clarifying quality criteria, are all crucial in policy terms” (Huff, Tranfield, van Aken, 2006, p. 415).

A. Huff’s words seem to be an adequate summary of the above considerations, which is contributory in outlining the essence of education management as a design science: „For some time, there has been an interest in *design* as a primary descriptor of management practice” (Huff, Tranfield, van Aken, 2006, p. 413). As A. G. Romme remarks, „in view of the persistent relevance gap between theory and practice, organization studies should be broadened to include design as one of its primary modes of engaging in research” (Romme 2003, p. 558). According to W. Gasparski, design is a primary descriptor not only management practice but also science and research (Gasparski, 2007, p. 34-47). He recalls Herbert A. Simon and Tadeusz Kotarbiński who indicated design as methodological distinction of management sciences (Gasparski, 2007, p. 34).

As W. Gasparski rightly observes, organization theory or management studies (which definitely include education management) are practical disciplines in the sense that T. Kotarbiński gave to this term (Gasparski, 2007, p. 34). Kotarbiński trying to answer the question, what is under the term organization theory/management studies, gave the following answers (Gasparski, 2007, p.35):

- The subject of organization theory includes positively cooperating teams.
- The reference for the organization theory is to indicate the conditions of the effective performance of tasks for which teams cooperate.
- The word organization means both an examined subject as an organized thing, which is a cooperating team, and the way of organizing, that is the structure/build of the organized things.

Undoubtedly, the above answers are also a good starting point for further research on the analytical sense of the concept of education management. Positively cooperating teams are the basis of education and education management. The teams are also the basis of educational institutions as organizations. The educational organization is both an organized thing (that is an educational institution) and the way of organizing the cooperating teams within the educational institution. The main reason of organizing the educational operation is to provide the best education possibilities achievable under the given conditions. It is the reference for the education management theory, which seems to fit into the concept of design sciences.

J. van Aken distinguishes three major categories of scientific disciplines: (i) formal sciences, (ii) explanatory sciences and (iii) design sciences (Aken, 2004, p. 224). In the formal sciences (such as

philosophy and mathematics) scientists build systems of empirically void propositions tested if they are logically consistent. The explanatory sciences (such as natural sciences and most social sciences) describe, explain and possibly predict observable phenomena within its fields. In these sciences researchers develop propositions accepted by the scientific community as true on the basis of the empirical evidence. The role of design sciences (such as engineering sciences, medical sciences, psychotherapy and a significant part of management) is to develop knowledge for the design and realization of artifacts (Aken, 2004, p. 224).

According to J. van Aken, „management practice has been defined as the art of getting things done by people” (Huff, Tranfield, van Aken, 2006, p. 413). She notices that „managers often do that without much reflection or design, acting directly on the basis of their tacit knowledge, intuition, and creativity, honed by experience” (Huff, Tranfield, van Aken 2006, p. 413). Thus, management research mission should be developing valid knowledge to support thoughtful, designing practitioners (Huff, Tranfield, van Aken, 2006, p. 413). J. van Aken formulates this conclusion for management seen as design science, but it does not lose anything for education management.

The all above considerations are closely related to the choice of paradigm in education management science. As J. van Aken remarks, „the choice of paradigm is important, because it drives the type of research questions asked and the type of research products produced. In an explanatory science, one is interested in “what is”; in a design science one is interested in “what can be” to solve a problem or to improve performance. Questions with respect to “what is” lead to descriptive knowledge; questions with respect to “what can be” lead to prescriptive knowledge. If in management research we undertook more research on the basis of the design sciences paradigm, we would produce more prescriptive knowledge” (Huff, Tranfield, van Aken, 2006, s. 413).

The above distinction is particularly important in relation to education management field, where the artificial processes of creating an educational reality (education policy, schools, school classes, school administration) meet natural processes of learning.

Herbert Simon in „*The sciences of the artificial*” (1996) divided all sciences into normal sciences and artificial sciences or explanatory sciences and design sciences as J. van Aken calls them (Huff, Tranfield, van Aken, 2006, s. 414). According to van Aken „a distinction must be made between the role of design in management practice and the idea of regarding academic discipline of management as a design science” (Huff, Tranfield, van Aken, 2006, s. 413). H. Simon writing about artificial sciences or the science of design uses the term artificial. He tries to explain its meaning:

„My dictionary defines "artificial" as, "Produced by art rather than by nature; not genuine or natural; affected; not pertaining to the essence of the matter." It proposes, as synonyms: affected, factitious, manufactured, pretended, sham, simulated, spurious, trumped up, unnatural. As antonyms, it lists: actual, genuine, honest, natural, real, truthful, unaffected. Our language seems to reflect man's deep distrust of his own products. I shall not try to assess the validity of that evaluation or explore its possible psychological roots. But you will have to understand me as using "artificial" in as neutral a sense as possible, as meaning man-made as opposed to natural.” (Simon, 1996, p. 4).

In the above sense, the term artificial refers thoroughly to education as a human product, particularly to educational institutions. Education is not like the laws of physics which must be utterly obeyed. It is being created by man and may be changed by man. Thus, a partly open question is what knowledge such management should produce: descriptive as in an explanatory science or prescriptive as in a design science. This open question means that the discussion in the paper is an attempt to answer the question, but at the same time is the starting point for further discussion. It is due to the nature of the problem itself. The problem is complex, ambiguous and open, which means that there is no one right solution.

Nonetheless, as D. Denyer, D. Tranfield and J. E. van Aken rightly remark, „recently there has been a rising interest in the design science paradigm and its potential for increasing the relevance and application potential of the research base” (Denyer, Tranfield, Aken, 2008, p. 393). At least two arguments support the endorsement of the design paradigm in an education management field. The first is the specificity of the research subject, which is the area of human activity, even if the learning processes themselves are conditioned in a natural way and require explanatory research. This is in accordance with the idea of design sciences which, according to W. Gasparski, benefit from the nomological sentences of explanatory sciences to confirm their own proposals (Gasparski, 2007, p. 34-47). Secondly, education is one of those areas of human activity in which the question "what is" is not enough to solve problems or to improve performance. More desirable are questions with respect to "what can be", which lead to prescriptive knowledge.

The advantages of design thinking for education management

Design thinking is perceived as an approach, methodology or even philosophy of creative thinking and doing that originates from the work of the best designers, architects, engineers and is currently used to solve a much wider range of problems (than traditionally designated design problems). It allows to creatively and effectively respond to complex and ambiguous human problems by designing innovative solutions focused on the needs and experiences of users. According to M. Wszółek i M. Grech design thinking is more and more established in scientific and business discourse as one of leading methodological approaches in modern organizations (Wszółek, Grech, 2016, s. 11). As D. Sobota and P. Szewczykowski claim, the approach was formerly known especially in the circle of industrial design as a methodology of designing new products in a comprehensive and sensitive to customer's needs and behavior way. It is recognized today as a typical example of triggering, intensifying and sustaining creativity in almost all areas of human life (Sobota, Szewczykowski, 2014, s. 92).

Although C. Owen claims that „design thinking is in many ways the obverse of scientific thinking” (Owen, 2007, p. 17), it may be an valuable asset not only for practice, but also for scientific research, especially within design sciences like management and education management. As C. Owen acknowledges, „where the scientist sifts facts to discover patterns and insights, the designer invents new patterns and concepts to address facts and possibilities” (Owen, 2007, p. 17). This statement is only partly true and requires wider analysis and discussion regarding to the adopted research problem. Thus, specific research tasks of the following part of this paper are to present design thinking approach and to indicate how important for education management is to look for such research methods and tools as those used in the design thinking approach. For this purpose, the analysis of the distinguishing features of the design thinking approach was conducted. On the basis of the analysis, the features especially advantageous for education management were abstracted. The most important of them have been presented below; this is design thinking as:

- human-centered approach,
- empathy-based approach,
- innovative approach,
- participatory approach.

Before discussing the results of the analysis, it is worth outlining the frames of the design thinking approach itself, especially that it is a much broader concept than is generally believed. According to U. Johansson-Sköldberg, J. Woodilla and M. Çetinkaya, the concept of design thinking is used both in the theory and practice of management. Although some researchers claim that there is no theoretical body, there is an extensive academic literature on design thinking approach (Johansson-Sköldberg, Woodilla, Çetinkaya, 2013, p. 121). The authors mentioned above present and

critically analyze five theoretical discourses on design thinking and major differences between them (Johansson-Sköldberg, Woodilla, Çetinkaya, 2013, p. 124):

- design thinking as the creation of artifacts,
- design thinking as reflective practice,
- design thinking as problem-solving activity,
- design thinking as a way of reasoning/making sense of things,
- design thinking as creation of meaning.

The above-discussed areas of discourse on the design thinking approach both outline the essence of this approach and show how difficult it is to determine its clear boundaries (which is due to the ambiguous nature of the approach itself). In the most general view, design thinking is an attempt to adapt the approach that is used by the best designers to creative thinking and actions aimed at solving complex, open and ambiguous management problems. Design thinking as a methodology results from an innovative, human-centered, explorative and iterative attitude towards the practice of design and reality itself. Although it is a non-specific methodology for management sciences, its advantages make it attractive and fruitful for designing innovative solutions in the sphere of management practice.

Design thinking as human-centered approach

The use of design logic not only in solving practical problems, but it also gives a number of advantages in research. Those especially important in the field of education management have been indicated above. The first of them is design thinking as human-centered approach.

According to M. Wszolek and M. Grech, the main paradigmatic property of design thinking is human orientation in the processes of designing. They refer to D. Norman who conceptualized the idea of human-centered design (HCD) in the 1980s (Wszolek, Grech, 2016, p. 14). D. Norman writes in the preface to the revised edition of the book „The design of Everyday Things”: „I added a very brief section on HCD, a term that didn't yet exist when the first edition was published, although looking back, we see that the entire book was about HCD” (Norman, 2013, p. xv). It means that there is no design without the human orientation. Human-centered design is „an approach that puts human needs, capabilities, and behavior first” (Norman, 2013, p. 8). As Norman notes, people are frustrated with the increasing complexity of everyday things and confused with never-ending changes and updates because of continued errors. In his opinion, human-centered design is the solution (Norman, 2013, p. 8). The prime value of HCD is the trouble-free use of design products by end users (Wszolek, Grech, 2016, p. 14).

If it is so important in the case of using everyday things, it must be crucial in the case of education processes. Due to the importance and specificity of education, which is itself focused on a human being, any changes should be carried out with extreme caution; so as not to cause the continued errors and never-ending confusion and frustration of education users (especially learners and teachers). Thus, human as the central point of the design thinking processes is crucial in education management. Experiences, needs and problems of students should be in the center of all education management processes. According to Norman, HCD is „the process that ensures that the designs match the needs and capabilities of the people for whom they are intended” (Norman, 2013, p. 8). Education management should be focused on the needs and capabilities of learners. There is no education management without human-centered approach. Thus, the starting point of building education management methods and tools should be empathy, the next identified here feature of design thinking.

Design thinking as empathy-based approach

The first step in design thinking process is empathizing (Brown 2009; Liedtka, 2011; Sobota, Szewczykowski, 2014). D. Sobota and P. Szewczykowski treat empathy as a way of learning the other person through observation and understanding (Sobota, Szewczykowski, 2014, p. 100). They emphasize the need to focus on empathy, the ability to communicate and go out to people (Sobota, Szewczykowski, 2014, p. 101). T. Brown writes about insights through empathy, through learning from the lives of others to create solutions that will improve their lives (Brown, 2009, p. 68-70). As he claims, „empathy is the mental habit that moves us beyond thinking of people as laboratory rats or standard deviations. If we are ‚borrow’ the lives of other people to inspire new ideas, we need to begin by recognizing that their seemingly inexplicable behaviors represent different strategies for coping with the confusing, complex, and contradictory world in which they live” (Brown, 2009, p. 75-76).

It seems also very important in education management. Both management and learning processes seem be incomplete without the empathizing and understood as the processes of learning others to understand them better. As J. Liedtka claims, empathy is the very beginning of designing process that encompass a deep understanding of those we are designing for. Liedtka uses the popular phrase „to stand in other’s shoes”. It means that we do not see our customers as targets for sale or a set of demographic statistics but as real people with real problems (Liedtka, 2011). P. Esser defines empathy as „the ability to understand and identify with another person’s context, emotions, goals and motivations” (Esser, 2018, dok. elektr.). According to her, using empathy is helpful in collecting subjective information by (Esser, 2018):

- looking at what people do,
- asking people to participate,
- trying things yourself.

Such an attitude allows both to realize certain practical goals within a human-centered approach as well as research goals through better understanding of the others and the way in which they experience the given situation in which they found themselves. Empathy allows to get closer to the real experiences, needs and problems of pupils/students whom the learning solutions and processes are designed and pursued for. The recognition of those experiences and problems (not only learning but all that students come across) should be at the root of education management.

Design thinking as an innovative approach

Design thinking is regarded by T. Brown „a methodology that imbues the full spectrum of innovation activities with a human-centered design ethos” (Brown, 2008, p. 86). An innovative attitude to the designed reality and the design process itself is one of the distinguishing features of design thinking approach. A number of authors pay attention to this, among others: T. Kelley and J. Littman (2001); T. Brown (2009), L. Kimbell (2011), U. Johansson-Sköldberg et al. (2013), D. Sobota and P. Szewczykowski (2014); D. Kelley and T. Kelley (2015).

L. Kimbell notes that one of the ways of describing design thinking is defining it as an organizational resource. In this notion, innovation are both the purpose and the focus of the design thinking approach (Kimbell, 2011, p. 297). According to U. Johansson-Sköldberg et al. „the concept of ‘design thinking’ became a portal for the whole design area to contribute to innovation, and design thinking enabled innovation to supersede strategic management as a way to deal with a complex reality” (Johansson-Sköldberg, 2013, p. 127).

T. Kelley and J. Littman note that design thinking as an approach to innovation is something more than just methodology:

„There are specific elements we believe will help you and your company to be more innovative. But it's not a matter of simply following directions. Our „secret formula” is actually not very formulaic. It's a blend of methodologies, work practices, culture, and infrastructure” (Kelley, Littman, 2001, p. 5).

The authors give an example of one of the steps of this approach, namely prototyping. It is not necessary to define the prototyping in detail here. What is important, prototyping is not defined as an formulaic method with subsequent steps to be taken. According to Kelley and Littman, „prototyping is both a step in the innovation process and a philosophy about moving continuously forward, even when some variables are still undefined” (Kelley, Littman, 2001, p. 5). It proves how adequate the design thinking approach can be for education management, where education processes need to be constantly managed in the circumstances of some variables undefined. It needs not only the simple methodology but also suitable education culture, relationship, infrastructure and work practices.

The another example of the above mentioned association is brainstorming. It is one of valuable tools used among others in design thinking. However, „it's also a pervasive cultural influence for making sure that individuals don't waste too much energy spinning their wheels on a tough problem when the collective wisdom of the team can get them „unstuck” in less than an hour” (Kelley, Littman, 2001, p. 5).

The all above shows that the use of certain management methods and tools in education field without deeper reflection, without understanding the broader context and individual situation of people involved in the education processes may not only be ineffective but even threaten the essential values of education. Each really fruitful education management method should be designed both as an open set of tools and guides which can be quite freely used and also a blend of culture, methodologies, infrastructure and work practices, which support the right selection of tools and their implementation. Concentrating too strongly on the proper realization of subsequent steps within the tasks given, it is easy to forget why it should be done at all. For example, one of the results of such an attitude is doing more and more tests for the tests themselves. Students are taught to achieve better results on tests without thinking about what those tests are to check and what the purpose of education actually is. In the design thinking approach, as T. Kelley and J. Littman acknowledge, „success depends on both what you do and how you do it” (Kelley, Littman, 2001, p. 5).

Design thinking as a participatory approach

According to E. Sanders, „there is a shift in perspective occurring today at the collaborative edge of design and social science. It is a change from a user-centered design process to that of participatory experiences” (Sanders, 2003, p. 18). As M. Wszolek and M. Grech write, design thinking focused on diagnosing problems and providing solutions that are effective from the user's point of view has been the subject of researchers' interest since 1960. In that context, they recall participatory design achievements that is one of the pillars of design thinking approach (Wszolek, Grech, 2016, p. 12). They recognize participatory design as one of the paradigmatic properties of design thinking, which involves turning users into the design processes. Such an approach uses uncountable capital of users' experiences, knowledge and perspectives that contribute to the design problem. The participatory approach uses user's perspective to effectively solve a problem but the user does not take responsibility for the result of work (Wszolek, Grech, 2016, p. 14).

L. Kimbell pays attention to „a distinction between the designing done primarily by professional designers and that done by end-users or customers” (Kimbell, 2012, p. 136). P. Ehn draws the distinction between participatory design perspective (designing for use before use) and meta-design perspective (designing for design after design) (Ehn, 2008, p. 92-101). The second perspective assumes a kind of flexible and partly open products, which users can customize and extend according

to the varying skills and needs. It is the idea of a continuing design-in-use or unfinished design. Users can continuously redesign received products (Ehn, 2008, p. 96). L. Kimbell notes that „designers can develop strategies that support different kinds of design-in-use, specifically reinterpretation, adaptation, and reinvention” (Kimbell, 2012, p. 136).

Both perspectives are important in education management. The first one (designing for use before use) gives the opportunity of including users (especially teachers and learners) in the designing teaching programs, processes and environments. The second (designing for design after design) extends the traditional way of understanding education roles and relationships. Enabling users (especially learners) continuously redesign the learning processes in which they are involved shifts some of the key responsibility from a teacher to a learner.

Discussion and conclusions

As W. Gasparski remarks, organization and management science belongs to the group of practical disciplines in the sense in which they provide knowledge that can serve as a premise for building projects that are the specialty of those who professionally deal with designing and shaping organizations. It is specialized knowledge derived both from theoretical/explanatory sciences, as well as the analysis of previously designed solutions and their functioning (successful or unsuccessful). The shaping organizations consists in structuring them (Gasparski, 2007, p. 38). However, the structure should be understood more broadly than Gasparski does. He defines it as the whole relationship binding individuals who create an organization (composition), and the individuals inside an organization with those from the outside (environment) (Gasparski, 2007, p. 38). The structure, however, not only binds people into an organization but most of all it provides them (together with established institutions) with patterns of action. It is a structure that ensures the continuity of an organization, although it changes itself as a result of the activities carried out within its framework.

This ability to change structures thanks to the structures giving patterns of action can be successfully used through design thinking structures to change education. T. Brown points to education as an important field of practical application of design thinking. He writes: „Perhaps the most important opportunity for long-term impact is through education. Designers have learned some powerful methods for arriving at innovative solutions. How might we use those methods not just to educate the next generation of designers but to think about how education as such might be reinvented to unlock the vast reservoir of human creative potential?” (Brown, 2016, p. 224). Brown is focused mainly on art schools but he draws his knowledge from general education and his conclusions are useful for any education processes. He gives an example of Ormondale, a public elementary school in the affluent Bay Area community of Portola Valley, whose staff are convinced that they need more innovation in teaching methods. As they say: „in order to produce 21st century learners, we could not use 18th century methods.” (Brown, 2016, p. 225).

For that purpose the teachers, through design thinking as a set of participatory processes, got involved into the processes of new education programs development. They did not want to get a finished product to implement. They took responsibility for the entire process from designing to implementation of the new teaching program in their school. Through brainstorming, workshops, curricular prototypes and observations of analogous institutions they had developed „a set of tools based on a shared philosophy of „investigative learning” that engages students as seekers of knowledge rather than receivers of information. The process—participatory design—mirrored the end product: a participatory teaching and learning environment” (Brown, 2016, p. 225).

Taking the above results into consideration, it can be concluded that education management cannot be a simple counterpart of business or general management in educational organizations. As it has already been said above, management methods and tools simply taken from other cultural contexts or institutions may not work properly elsewhere. They have to be particularly developed for the needs

of the definite organization taking into account its in-depth specificity. The assumptions which connect education management and general management as a design science are those regarding to the way of providing the knowledge that can serve as a premise for action in practice. Then designing solutions aimed at achieving the adopted objectives will take into account the nature of structures and institutions ensuring the continuity of organizations in which the solutions are designed and realized.

The specialized education management knowledge must be continuously derived from the analysis of designed solutions and their successful or unsuccessful functioning in the real educational organizations with real structures and institutions. To design the solutions, the previously synthesized practical knowledge and the knowledge from explanatory sciences connected to education are needed.

It shows what is the basis of creating knowledge in education management as a design science and why it is not possible to create knowledge in isolation from designing and analyzing proposed solutions. In the area the question "what is" is not enough to change existing situations for the better. The more desirable question is "what can be", which leads to prescriptive knowledge. Research based only on the question „what is”, which is typical for explanatory sciences, is not enough in such sciences as education management. The education management is a science that is strongly embedded in practice, in real educational organizations, structures and institutions. Thus, searching for such research methods and tools as those in design thinking is so necessary.

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